DOCUMENT RESUME

ED 188 534 HE 012 823

AUTHOR Webster, David S.
TITLE The Ph.D. Job Shortage, and Some Responses University Administrators Might Make to It.
PUB DATE May 80
NOTE 36p.

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Administrative Policy; College Administration; *Doctoral Degrees; Doctoral Programs; *Education Work Relationship; *Employment Opportunities; Employment Projections; Graduate Study; Higher Education; Labor Economics; Labor Market; Labor Needs; *Labor Supply; Literature Reviews; *Policy Formation; Teacher Supply and Demand; Trend Analysis

ABSTRACT

Recent literature that suggests policies university officials might adopt to bring Ph.D. supply and demand into some equilibrium is reviewed. Some literature documenting the present oversupply of new Ph.D.s and some supply and demand forecasts concerning the market for new Ph.D.s in the next 15 years are briefly reviewed. Predictions that were made between 1950 and 1970 of expected Ph.D. supply and demand during the 1970s are also examined to assess the success that forecasters have had. Among the policy options open to university faculty and administrators to control the oversupply of Ph.D.s are the following: (1) do little or nothing, and let market interactions bring supply and demand into equilibrium; (2) limit the number of Ph.D.s produced by controlling the number of universities/departments offering the degree or the number of students admitted/retained; (3) change faculty personnel policies to increase demand for new Ph.D.s; (4) revise Ph.D. programs; and (5) find new employment opportunities for Ph.D.s. A bibliography is included. (SW)

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THE PH.D. JOB SHORTAGE, AND SOME RESPONSES UNIVERSITY ADMINISTRATORS MIGHT MAKE TO IT

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David S. Webster
Chancellor's Intern Fellow
UCLA

May, 1980

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Introduction

Since about 1970 American universities have been producing too many new Ph.D.'s -- in virtually all disciplines -- relative to the job openings for them, both in academic and non-academic employment. And the labor economists and others who have studied the situation agree nearly unanimously that there will continue to be an oversupply of Ph.D.s at least until 1990. This paper seeks to do four things: first, to review briefly some of the abundant literature documenting the present oversupply of new Ph.D.s; second, to review equally briefly some of the many supply and demand forecasts concerning the market for new Ph.Ds in the next fifteen years; third, to look at some past predictions -- made between 1950 and 1970 -- of expected Ph.D. supply and demand during the 1970s, for the purpose of assessing the success that forecasters of the Ph.D. labor market have had in the past. Finally, the main section of this paper will review some of the recent literature suggesting what policies university officials might adopt to bring Ph.D. supply and demand into rough equilibrium.

The Present Oversupply of Ph.D.s

The present oversupply of Ph.D.s has been thoroughly if informally documented both by articles in the popular press and by the horror stories told by new or prospective Ph.D.s as they

return from the flesh markets of their discipline's annual meeting. Though the job shortage did not occur at the same time in all disciplines -- it is generally agreed that physics was the first (28) -- and it is not equally severe in all disciplines (of the major fields, English, with a current unemployment rate of 33% of all new Ph.D.s (13) is the worst) -- the current severe job shortage extends through virtually all disciplines, with a few exceptions like economics (4). The oversupply of Ph.Ds occurred quite suddenly. As Allan Cartter (10) pointed out:

> "Between 1957 and 1967....demand for personnel trained at the doctoral level rose rapidly, seemingly far outstripping the number of new Ph.D.s being awarded by the nation's major universities. Since 1967 enrollment growth has been more moderate, at approximately 4 percent annually, and university research funds have remained almost constant in real dollars. In addition, after a lag in supply adjustment, the number of doctorates awarded increased by 70 percent between 1967 and 1973. Thus, as the popular press has reported it, the academic labor market shifted from 'boom' to bust conditions within several years.

One result of the oversupply of Ph.D.s is <u>unemployment</u>. According to the 1975 report <u>Ph.D. Manpower: Employment Demand, and Supply, 1972-85</u> (33):

> "Unemployment data for selected groups of Ph.Ds indicated that although their unemployment rate was much lower than the average for all workers, it had increased significantly during the 1968-1971 period.

Another is <u>underemployment</u>, as evidenced by the increasing number of new Ph.D.s who are getting jobs as community college and even high school teachers. A third result is that Ph.D.s who <u>are</u> hired at traditional jobs are earning lower salaries. in real dollars,

than their predecessors ten and even five years ago, as shown in Freeman and Holloman's "The Declining Value of College Going" (22) and James O'Toole's "The Reserve Army of the Underemployed" (32). Still another result is that it now takes more time than before for new Ph.D.s to get any job offers at all. According to the National Research Council's Summary REport, 1975: Doctorate Recipients from United States Universities (30), in the summer of 1975 more new Ph.D.s had no firm job offer than had their counterparts one year earlier:

> "The arts and humanities showed the largest increase with the percentage not having a firm commitment increasing from 29.5% in 1974 to 33.4% in 1975, followed by the social sciences where the 1974 figure of 21.2% increased to 22.9% in 1975.

David W. Breneman, Staff Director of the National Board on Graduate Education, made the same finding when he collected job commitment data for five major disciplines (4). Comparing the proportion of new Ph.D. recipients who reported no specific employment prospects at receipt of the degree, the differences between 1968 and 1973 (the last year for which he collected data) are striking. In chemistry, the figures are 4.5% for 1968 and 17.2% in 1973; in economics (the discipline in which the disparity between 1968 and 1973 is by far the smallest), 3.1% and 6.4%; in electrical engineering, 7.1% and 15.0%; in English, 3.9% and 21.5%; in psychology, 6.1% and 13.6%. At least equally striking are the figures concerning the employment prospects of recent Ph.D.s who had received their degrees from the very best departments. When

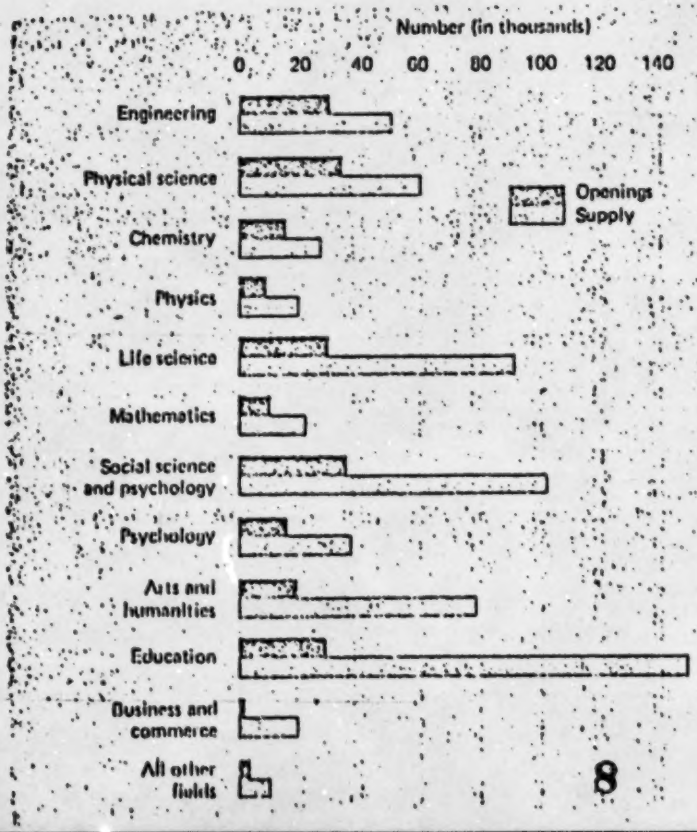
Breneman compared the proportion of new Ph.D.s who earned their degrees from departments rated from 4.0 to 5.0 (the highest rating) in Roose and Andersen's A Rating of Graduate Programs (35), he found that in each case the proportion of 1973 Ph.D.s from these top-rated departments who had no offer was higher than the equivalent figure for Ph.D.s from all departments in 1968. The figures for all departments in 1968 compared to top-rated departments in 1973 are as follows: chemistry, 4.5% (1968) and 12.1% (1973); economics, 3.1% and 4.9%; electrical engineering, 7.1% and 14.5%; English, 3.9% and 16.1%1 psychology, 6.1% and 11.4%.

PREDICTIONS OF PH.D. SUPPLY AND DEMAND, 1977 - 1990

Not only is there a present great oversupply of Ph.D.s, but most students of the academic labor market agree that this situation will continue for at least 15 more years, and perhaps until the end of the century. We will briefly sample some of their opinions and predictions. An April, 1973 report of the Carnegie Commission on Higher Education, College Graduates and Jobs: Adjusting to a New Labor Market Situation (6), reported that:

"Numerous estimates of the supply and demand for holders of doctor's degrees have been made in the last few years, and there are some wide differences among them, especially on the supply side. But they all lead to essentially the same conclusions --there is likely to be a large and growing surplus of Ph.D.'s in the 1970s, a surplus that will reach sizable proportions by 1980, at least in relation to any reasonable projection of demand based on past patterns of employment of Ph.D.'s.

Ph.D. Manpower: Employment Demand, and Supply, 1972-85 predicts that between those years our nation will produce 580,000 doctorates, and that the number of jobs open to them (academic and non-academic jobs combined), of the type traditionally held by Ph.D.s, will be about 187,000, and that there will be job shortages in every field. The graph below, reproduced from the report, shows projected numbers of job openings and new Ph.D.'s broken down by academic field:



The outlook for Ph.D.'s during the 1970's and early 1980's probably will not be as bright as in the past. Increasing numbers may work in jobs not formerly held by Ph.D.'s. In some fields Ph.D.'s will feel the effects more strongly than in other fields.

[1975 ..prediction]

Likewise, Dael Wolfle and Charles V. Kidd, in a well-researched Science article on Ph.D. supply and demand (40), present a gloomy picture of Ph.D. employment opportunities in the years ahead:

> "Projections of future utilization agree that the number of positions will also increase substantially during the 1970's, but not as rapidly as the number of degrees. Many new doctorates will enter nontraditional jobs and will do work that has not attracted many of their predecessors. Moreover, unless strong corrective actions are taken soon, new doctorates of the 1980s will face even bleaker prospects for jobs in the fields where they have traditionally been employed. For colleges and universities will make few new appointments during the 1980's but will be able to educate more doctoral candidates than can be effectively employed in positions which have thus far required this level of education. Few of them will be unemployed, but few will be employed in college and university teaching and research.

Allan Cartter and Lewis Solmon, in a recent Change article, (13) are no more optimistic:

> "The annual hiring of junior faculty, which averaged 27,000 between 1962 and 1972, will average not more than 16,000 between 1972 and 1982 and will tend to fall to not more than 10,000 between 1982 and 1992. Since about 41,000 new Ph.D.'s will be produced annually during the remainder of this decade, total academic demand will be about one third of the graduate school outflow over the next few years. It may decline to about one fifth in the 1980s when about 46,000 new Ph.D.'s will be produced annually. This contrasts sharply with the pre-1970 period when at least half of the new Ph.D.'s took teaching jobs in colleges and universities.

Those who stand to be hurt the most are members of that historically most favored of groups, white males. The Carnegie Commission report, College Graduates and Jobs (6), states:

> "A group especially to be hurt will be majority male Ph.D.s....their general prospects are dismal, particularly because of the high supply of and low demand for Ph.D.s but also because of the current efforts at hiring women and minority males. They constitute a special potential crisis situation that will result in massive disappointments in the later years of the 1970s and the early 1980s. This is the most serious single problem area we see ahead.

Finally, in his recently published, extraordinarily comprehensive and informative volume, Ph.D.s and the Academic Labor Market (10), Allan Cartter paints an exceptionally bleak picture of the employment opportunities for Ph.D.s in the years ahead. To cite only a few of his gloomy predictions, he writes:

> "Doctorate production is expected to peak between 1981 and 1985, while academic employment is projected to be at its lowest level. Only after 1990 is there likely to be a significant recover in the number of academic openings available and in the early 1980s probably less than one in five Ph.Ds are likely to find academic positions.
>
> "The last half of the 1970s appears to be an approximate continuation of the 1971-1975 experience -- not particularly good, but not a severe oversupply period. The 1980s outlook, however, is bleak by any standard, and only a handful of disciplines are likely to come through relatively unscathed.
>
> "While most current graduate students recognize that job opportunities in the 1980s are limited as compared with the recent past, few students or faculty appear to recognize the magnitude of the potential problem.

These are a sampling of recent predictions about the job market for new Ph.D.s in the years ahead; it is worth noting that this writer has been unable to find a single study published since 1970 which predicts a much rosier outlook than the one presented above.

Some Past Predictions about American Higher Education

The forecasts, then, are virtually unanimous, but it is worth considering that in recent history many who have tried to predict the future of American higher education have turned out to be considerably less than prescient. As a sociologist has pointed out (19):

> "...not a single observer of the campus scene as late as 1959 anticipated the emergence of the organized disaffection, protest and activism which was to take shape early in the Sixties...."

And very few students of higher education, once they geared up to write about campuses in turmoil and Dr. Spock babies, were prepared for this protest and activism to end, at the end of the 1960s, as suddenly as they had begun. In 1971, an article published in a major journal of higher education predicted, with amazing inaccuracy, that "the immediate outlook for women in university teaching is grim indeed" (15).

In 1963 Clark Kerr's famous Uses of the University (26) depicted the "knowledge industry" as the fastest growing sector of the American economy and strongly implied that this rapid growth would continue, but a decade later, in an era of decreasing numbers of college students, bankrupt colleges and stagnating levels of federal support in real dollars for R and D we learned that this prediction was most inaccurate. In 1968 Jencks and Riesman's Academic Revolution (25) chronicled the steady growth in salary, perquisites and power of the American college faculty and strongly implied that this "revolution" was an

ongoing one, but only a few years after the book's publication the counter-revolution began, and declining college enrollments, combined with an increasing oversupply of Ph.D.s seeking employment, have resulted in college professors making less money (in real dollars) and having less power, vis à vis both college administrators and governing boards, than they did when Academic Revolution was published.

There is no area where scholars who predict the future of American higher education have been less prescient than in predicting future Ph.D. supply and demand. Despite some lonely voices, such as Berelson in his 1960 Graduate Education in the United States (3) and Allan Cartter, in a number of studies commencing with his iconoclastic Educational Record article of 1965 (8), during the years 1950-1970 they virtually unanimously predicted a shortage, very often a severe shortage, of Ph.D.s for today. The Fund for the Advancement of Education concluded in 1953 (41) that the number of Ph.D.s produced "up till 1970 will rise more slowly than the need for college teachers" so that as a result "our colleges will find it impossible to lure new teachers of the same average quality and educational preparation as their present faculty." The distinguished Committee of Fifteen predicted in 1955 (37) that to expect that the number of Ph.D.s in the year 1970 would only be about 20% of what was needed "is not statistical hysteria but grass roots arithmetic." In 1957, the prestigious President's Committee on Education Beyond the High SChool (34) concluded that "present estimates based on relatively optimistic assumptions

indicate that there may only be one new Ph.D. available for every 4 or 5 college teachers needed between now and 1970."

Post-1960 views are much the same. One educator wrote in 1960 that "every year of the last decade the decline in the proportion of Ph.D.s available for filling college and university positions has accelerated," and that only "heroic efforts" could prevent the "serious crisis" of an imminent undersupply of Ph.D.s (5). Another educator in 1965 (29) warned a meeting of the Association of American Colleges, "I repeat with all the urgency I can command that our traditional and conventional doctoral programs will simply not produce the number of teachers with doctor's degrees our educational system demands." A college dean argued in 1964 (14) that the imminent shortage of college professors constituted "a major national scandal," and he thought that the teachers required to stem the enrollment tide were "nowhere in sight."

The projections of an undersupply of Ph.D.s continued even in three studies published in 1970. In that year three well-known writers correctly foresaw that in most fields the supply of Ph.D.s was catching up with the demand, but they predicted that in the humanities, "even with the large projected expansion of humanities doctorates, the colleges and universities will absorb all of the output for the next 20 years" (20). Lewis Mayhew, in a small volume predicting the state of graduate and professional education in 1980 (27), spoke of con-

flicting evidence about the future need for Ph.D.s and then chose the decidedly wrong evidence to accept:

> "In spite of conflicting evidence -- which on the one hand implies a continuing shortage well into the 1980s and on the other an actual oversupply of Ph.D.s by the late 1970s -- institutional leaders tend to believe that shortages will persist in all save a few fields well into the 1970s and probably beyond.

And a UC/Berkeley researcher (24) concluded that so many college teachers would be needed in the near future that this need could not possibly be met from the ranks of Ph.D.s, and she recommended that:

> "Informed by the need for approximately 200,000 undergraduate teachers in the next five years...graduate schools should give serious consideration to the need for a new degree for college teaching such as the Doctor of Arts....

So, in considering possible responses on the part of academic administrators to present and projected oversupplies of Ph.D.s, we must bear in mind that at present the prediction of the future of American higher education is very much an art, not a science. Though the number of people who will reach the age of eighteen for the next eighteen years, barring nuclear war or some other disaster, is quite predictable, there are enough uncertainties about how many of them will go to college, what kinds of colleges they will attend, what future student-faculty ratios and government R and D expenditures there will be, and -- on the other hand -- what the supply of Ph.D.s will be, to caution us that the forecasts we have cited, though they are virtually unanimous, are not necessarily perfectly -- or even approximately -- accurate.

Possible Responses on the Part of University Administrators to the Present and Probable Future Oversupply of Ph.D.s

Assuming, though, that the oversupply of Ph.D.s, as virtually all who have studied the subject agree, will persist for the next 10-15 years, what policies can bring supply and demand nearer to equilibrium? Policy decisions can be made on many levels -- by academic departments, universities, groups of universities, professional societies (the Modern Language Association, the American Institute of Physics, and so on) and by local, state, and the federal government. In this paper, though, we will consider only possible policy responses of university faculty and administrators and will not discuss the options of professional societies and the various levels of government. Options open to university faculty members and administrators to control the oversupply of Ph.D.'s fall into five groups.

1. Do little or nothing, and let market interactions bring supply and demand into equilibrium

2. Limit the number of Ph.D.s produced, by controlling:

   a. the number of universities offering the Ph.D.
   b. the number of departments in each discipline offering the Ph.D.
   c. the number of departments in an institution offering the Ph.D.
   d. the number of students admitted into or retained by Ph.D. programs

3. Change faculty personnel policies to increase demand for new Ph.D.s

   a. tenure policies
   b. retirement policies
   c. course staffing policies

4. Revise Ph.D. programs

5. Find new employment opportunities for Ph.Ds.

We will discuss and comment briefly on these five types of policies.

1. Do little or nothing, and let market interactions bring supply and demand into equilibrium

The most sophisticated argument in favor of this policy is that of Freeman and Breneman, in the National Board on Graduate Education monograph, Forecasting the Ph.D. Market: Pitfalls for Policy (21). They argue that no matter how large the oversupply of Ph.D.s presently is, natural market responses will soon align supply and demand. As they see it, the gloomy employment prospects of today's Ph.D.'s, the great amount of publicity that these gloomy employment opportunities are getting in the popular press, the fact that in response to the "glut" of Ph.D.s on the market, salaries (in real dollars) and working conditions for them are bound to get worse, and many other factors resulting from the very tight job market will combine to make working towards a doctorate much less attractive than it has been recently. Thus, according to them, the number of first-year graduate students in years to come will fall sharply, so it is not necessary for university administrators to effect any particular policies to limit Ph.D. production. But assuming that what Freeman and Breneman write about inevitable market responses is correct, one could argue that there must be a more efficient and humane way of bringing supply and demand into equilibrium than by having tens of thousands of unemployed

and underemployed Ph.D.s and waiting for news of their plight to control doctorate production.

Another argument in favor of university laissez-faire is made both by Allan Cartter (10) and the Carnegie Commission Report, College Graduates and Jobs (6). They both argue that if an especially bright, ambitious student wishes to enter a Ph.D. program in a particular discipline, in our free society he should be allowed to, no matter how unpromising his job prospects, for the sake of his own intellectual enlightenment and fulfillment. (Cartter adds, though, that such students should not be given federal financial support). They argue that if first-rate universities turn such students down, there is no assurance that they will switch to other occupations with brighter employment prospects; they may simply pursue their original goal in weaker departments, and thus they stand to be less well-trained and employable (and, for that matter, less enlightened and fulfilled) than if they had been admitted to their first-choice departments.

The authors of College Graduates and Jobs argue further -- and in this they are joined by a dean of graduate studies (23) -- that no matter what the job prospects of a particular Ph.D. recipient, the social benefits, above and beyond any income he may earn, are so substantial that they alone make earning the degree worthwhile. But their arguments are not entirely convincing. For one thing, they fail to document these alleged benefits. For another, it is at least arguable that whatever social benefits are conferred on students by higher education are conferred

by the first four (or fewer) years. As the authors of another Carnegie Commission report (7) write:

> "...many of the "externalities" or social benefits from higher education in political and social behavior will have been developed at the undergraduate level, if they are developed at all, and will not be increased much by graduate study.

In addition, it is quite possible that if someone enters a Ph.D. program and goes on to become a college professor -- thereby having achieved his educational and career goals and having embarked on a rewarding and stimulating career --then his Ph.D. will confer all kinds of benefits on society above and beyond his lifetime income; this contented scholar may well be an above-average parent, a voter, a model taxpayer, a good community citizen, and so on. But if the same individual sweats his way through an arduous Ph.D. program and then ends up, frustrated and unhappy, teaching in a high school, there is reason to doubt whether he will be such a model citizen as if he had had a satisfying job. At the very least, empirical studies should be done to evaluate the claim that Ph.D.s can confer social benefits even if their recipients are frustrated in their careers.

Two more arguments in favor of a more or less laissez-faire policy are as follows: that we should not react so quickly to curtail the supply of Ph.D.s, for even though there may well be an aggregate oversupply, there may be shortages in certain specific disciplines, and we cannot predict with certainty where

these will be. Another, made by Allan Cartter (10), is that the supply of Ph.D.'s should not be calibrated precisely to match the demand. A modest oversupply of labor makes for an efficient market, he says (he makes a comparison with the market for medical and dental care), and besides, an oversupply will mean that all colleges, even marginal ones in marginal locations, will have a good opportunity to attract bright young scholars, and these will upgrade the quality of many of America's less than first-rate campuses.

2. Limit the number of Ph.D.s produced

Limiting the number of Ph.D.s produced could be accomplished in a number of ways, or by some combination of them -- by reducing the number of universities granting the Ph.D., reducing the number of departments in each discipline offering the degree, or by reducing the number of departments on a campus offering the degree. Alternatively, the number of institutions and departments offering the Ph.D. could remain the same, but the number of students admitted to and/or retained by these departments could be curtailed. WE shall discuss a number of suggestions along these lines.

a. suggestions to limit the number of Ph.D.-granting universities or departments

Several writers suggest that only a certain number of institutions should be allowed to grant the Ph.D. Cartter (11) suggests that it would be nice if by "the wave of a wand" the

nation's some 200 doctorate-granting institutions could be reduced to 75 or 100. The authors of College Graduates and Jobs suggest that Ph.D.s should be granted by only the best 60-70, or at very most the best 100 departments, in each discipline. Wolfle and Kidd (40) suggest that the present 60 or 70 largest Ph.D.-granting institutions, which presently award about 70-80% of all Ph.D.s, should all voluntarily reduce their size.

But there are certain to be serious problems -- to put it very mildly -- in the implementation of such suggestions. For one thing, should Ph.D.-granting universities be limited, or Ph.D.-granting departments? Should Ph.D. production be limited to, say, the 75 largest (or best) Ph.D. producing universities, or the 75 largest (or best) producers in each discipline? Obviously, some universities produce many Ph.D.s in some disciplines and few or none in others. And if we retain Ph.D. programs at only the 75 largest Ph.D. producing universities, then we emasculate entire programs that are small in number of doctorates produced but high in quality, such as those at Bryn Mawr and Dartmouth. If we limit Ph.D. production to, say, the 75 largest or best universities across-the-board, then we have the further problem of what to do with programs of high quality in an institution that is not noted for its other graduate programs. According to Roose and Andersen's A Rating of Graduate Programs (35), in 1969 UC Riverside was ranked fourth in the United States in its graduate department of

entomology, the University of Georgia ranked 3rd in population biology, the University of Delaware 10th in chemical engineering, the U. of Arizona 12th in anthropology and the University of Pittsburgh 4th in philosophy, though it is doubtful if any of these universities would be ranked among the top 60 Ph.D.-producing institutions in either quantity or quality. Should we, then, choose to maintain these particular programs, because of their excellence, and discontinue these universities' other Ph.D. programs?

There are more problems with the suggestion of cutting back to 60-75 universities or departments. Cutting back to, say, the largest or strongest 75 departments nationally might work well in fields like chemistry or physics, where, according to Lewis Mayhew (27), there were respectively 96 and 82 Ph.D. programs offered in 1970, but what should be done with fields like geography (20 programs), musicology (17), Slavic languages and literature (17) and disciplines that are represented by even fewer programs? Should we retain them all, since they are all well under the arbitrary number of 60, or cut, say, 25% of them, or do we study departmental quality and long-term job market conditions on a discipline-by-discipline basis and let those results be the guide?

Still another problem involves the relation of Ph.D. "output" to "input." Those who suggest limiting the production of Ph.D.s to a number of "leading" graduate schools assume that these schools invariably turn out "better" Ph.D.'s than do their less

prestigious counterparts. But it is not at all clear that they do so when their students' input characteristics are carefully controlled for. Most of the existing literature on colleges' input and output focusses on undergraduate students, but this body of literature by no means leads one to believe that quality of institution makes a great deal of difference in student output. Alexander Astin (1), for example, studied college seniors' performance on the area (achievement) tests of the GRE, and he found that "performance on the GRE was unrelated to college 'quality,' once student ability and social background were taken into account." Extensive reviews of the literature on correlations between undergraduate school quality and subsequent success (36), undergraduate school quality and affective traits (18) and undergraduate institution and later income (39) all fail to present clear-cut evidence (though some individual studies treated in these extensive reviews of the literature do seem to present such evidence) that quality of undergraduate education, when socioeconomic status and ability are controlled for, has much effect on any aspects of a person's later life. If the same is true of graduate education, as it may well be, then if we wish to curtail the number of schools granting Ph.D.s, there is little reason to maintain the universities or departments that are judged to be the "best." We might as well choose to preserve universities or programs that are near to population centers, or those that are cheap to

operate, or we might choose to maintain universities and departments that, regardless of excellence or cost of operation, are geographically well-dispersed.

Most troublesome of all, if it is desirable to eliminate some or all Ph.D. programs in certain universities, how is the decision to be made and enforced? When the Louisiana Board of Regents recently ordered each of the state's seven public universities to eliminate one or more doctoral programs, several of the universities protested vigorously (38), though the programs that were cut were marginal programs at marginal institutions -- the Ph.D. in mathematics at Louisiana TEchnical University, for example, and the Ph.D. in history at the University of Southwestern Louisiana. If institutions such as these protest vigorously the loss of one or two programs, one can imagine the reaction of a university more eminent than these, but still not within the nation's leading 75, being told to close down all its doctoral programs. David Breneman (4) has suggested that universities which give up the Ph.D. might still offer the Doctor of Arts degree for those who wished to become college or community college teachers. But this suggestion is similar to the one made a decade ago by Jencks and Riesman (25) to the effect that marginal four-year colleges for blacks should drop their four-year programs and degrees and seek to become first-rate two-year colleges. So far no institution has chosen to make that change. In short, restricting Ph.D. pro-

grams to some 60 or 75 universities, or some 60 to 75 departments within each discipline, would cause a host of extremely touchy and as yet unresolved problems.

There are some other ways to restrict production of Ph.D.s, which we will pass over briefly. Ann Heiss (24) has revived a suggestion made more than a decade ago by George Stigler of the University of Chicago economics department; she suggests that universities should offer Ph.D.'s not "across the board" but only in a limited number of fields they are truly excellent in. Lincoln Moses (28), in a variant of this suggestion, recommends that campuses which are part of a statewise system might each offer Ph.D.s in a few fields so that, on a system-wide basis, all fields are "covered," even though each individual campus "covers" only a few.

b. suggestions to limit the number of students admitted into or retained by Ph.D. programs

Another way to limit the production of Ph.D.s is to retain the present number of Ph.D. granting institutions and departments, but reduce the flow of students into and through the system. Allan Cartter, in Ph.D.'s and the Academic Labor Market (10) and elsewhere, suggests that students who apply be apprised of projected job market prospects five years hence, and that that news, in times like the present, would discourage many from applying. He also suggests that in this time of job scarcity, graduate departments should raise both their admission and retention standards. A Carnegie Commission on Higher Education study (7) has suggested that all institutions

of higher learning should bring their tuition charges much more nearly into line than at present with the cost of the education provided. If this suggestion were implemented, costs for doctoral education at both public and private institutions would rise greatly, and these higher costs would certainly reduce the number of applicants. Cartter (10) has further suggested that in the 1960s graduate programs became too large at many instituions, and that high quality, efficient graduate programs could function at about half the size of the average outstanding department during that decade. (On the other hand, a National Science Board study (31) concludes, largely on the basis of studies of small-group interaction, that a certain "critical mass" is needed for high-quality faculty interaction, and that consequently no department should have fewer than seven instructors).

Many of these suggestions, it seems to us, have shortcomings. We have no quarrel with the idea of raising admission standards, but it seems that most of the reduction of students flowing through graduate programs should be done at the admissions (not retention) level. To drastically raise retention standards and eliminate a high percentage of students from doctoral programs at various stages alongs the way, would be wasteful in terms of both the universities' resources (it costs about $50,000 to send one student through a doctoral program, so it presumably costs somewhere around half that to send him through half a program) and also wasteful in terms of the time

and effort students had put into their (uncompleted) programs. So far as raising the costs of doctoral education so that they more meraly reflected costs is concerned, though this measure would undoubtedly reduce (probably very sharply reduce) the number of students entering doctoral programs, it would also restrict students seeking admission not to the brightest, but (unless large university or federal fellowships were allotted to many students to offset these costs) to the wealthiest stubents, a situation that a nation which conceives of itself as a democracy and a meritocracy should not welcome.

3. Change faculty personnel policies

There are a number of ways in which one can change faculty personnel policies to "open up" jobs for new Ph.D.s.

a. Tenure policies

The obVious way is to abolish tenure entirely, so that faculty members can be replaced at any time by younger, possibly more up-to-date in their disciplines, possibly more productive, and certainly cheaper, new Ph.D.s. Another possibility is to give tenure to a much smaller percentage of those who "come up" for it than at present. Allan Cartter (11) presents two fresh ideas. First, he suggests that faculty members could relinquish tenure "rights" at age 60 or after 25 years of service, whichever came first. Another possibility Cartter suggests (12) is that colleges should

not to grant tenure after six or seven years, as is now frequently done, but to grant junior faculty members three year moving tenure (so that at every stage they would have tenure for three years into the future) with a permanent tenure decision coming after twelve years.

b. Retirement policies

Another way to "open up" more faculty positions for new Ph.D.s is to have present faculty retire earlier. This is suggested by Wolfle and Kidd (40) and also by Cartter (12), who estimates that if the standard retirement age were reduced to 64, the number of openings for new faculty members would be about 15% greater than at present each year, and considerably greater than that during the transition period.

c. Course staffing policies

Another way to open up positions for new faculty members is to have present faculty members teach fewer students. This could be accomplished by reducing student-faculty ratios or by reducing faculty members' teaching "loads." A National Board on Graduate Education Study (16) suggests that many graduate students now teaching undergraduate courses should be replaced by faculty members.

Of these suggestions, the ones that seem best are those to grant tenure to a smaller proportion of junior faculty than at present and to defer permanent tenure decisions until after

twelve years or so of service, as long as the instructor is protected by short-term "moving" tenure until a final decision is made. TEnure, of course, confers not only academic freedom but also job security upon those who hold it, and to strip a Chaucer or Renaissance musicology professor of tenure at age 60 will often be, in effect, to retire him. If he is dropped by his university, he is not likely, at that age and with the stigma of having been released, to find academic employment elsewhere, and at that age and with the interests we have specified, his chances of finding non-academic employment will not be great. It be quite wise to retire many or most faculty members at age 60, but if we wish to do that we should stipulate that that is what we are doing, and not claim that we are merely removing tenure when faculty reach that age. The National Board on Graduate Education's idea that more faculty, and fewer graduate students, should teach basic courses is good in principle, but in the present era of financial stringency it is scarcely likely to be widely adopted.

4. Revise programs for training Ph.D.s

Another way to reduce the oversupply of Ph.D.s is to revise the nature of Ph.D. training. Gardner (23) suggests that Ph.D. programs ought to be more flexible, so that they would train

people not for one discipline, or one sub-discipline, but for a number of different fields, so that the graduate, upon reaching the job market, could have greater latitude of choice than at present. Yale economist Stephen Dresch suggests (17) that many Ph.D.s in scientific and technical fields ought to be trained, not at universities but at research institutes, as is already being done at Rand Corporation and Arthur D. Little, the Cambridge, Massachusetts management consulting company. Though he recognizes that training Ph.D. candidates in research institutes rather than at universities would not necessarily decrease the number of Ph.D.s that were produced, at least (since Ph.D. candidates would be employed by these organizations while they were working towards their degrees) they would not incur the huge loss in foregone earnings that full-time graduate students at universities often do.

If seems to me that both of these suggestions, while solving some problems, would cause others. In the first place, people's interests and cognitive abilities generally are not widely interchangeable among many different disciplines. When undergraduate students, for example, change majors, as Helen Astin (2) has shown, they usually change to a major within the same "cluster" of majors, from history to political science, or from mathematics to engineering, but not from history to mathematics. Assuming that they change within "clusters," at least partly because their main academic strength lies within one group or related majors,

and assuming that the same is true of graduate students (who are, after all, only a few years removdd from undergraduate major-switching themselves), then most Ph.D. candidates in, say; French, will not be able to switch to electrical engineering no matter how attractive the job market is in that field, because they will lack the ability to earn a Ph.D. in electrical engineering. French majors may be able to switch successfully to other fields in the humanities or social sciences, but presently there are oversupplies of Ph.Ds in virtually all the humanities and social sciences, so that switching from one field to another within these areas will do little to improve one's employment prospects.

As far as Dresch's suggestion is concerned, it seems to me that one advantage of training our scientists and technologists at universities is so that they may be exposed, during their course of study, to the presumably humanizing influence of the university's liberal arts programs and ambience. It could be argued that to train our future scientists in institutions like Rand and the Hudson Institute would be to run the danger of producing scientists less imbued with humane values than at present. At any rate, though this plan might work with a few graduate students in a few disciplines, it is not a solution for training people in the humanities and the "soft" social sciences, and is not a solution, given the very small number

and size of these research institutions, for training more than small numbers of Ph.D.s, even in the sciences and "hard" social sciences.

5. Find new employment opportunities for Ph.D.s

The strongest case for finding new employment opportunities for our present and future unemployed Ph.D.s has been made by Lincoln Moses in a Science article (28). He predicts, as many others have, that in response to the present oversupply of doctorates, some fields of teaching, as in community colleges or even high schools, which have seldom required Ph.D.s before, may now come to do so. And as new fields and disciplines are created, since at the outset there will, of course, be no Ph.D.s in those disciplines, Ph.D.'s in "adjacent" fields can staff them. To use an example we used earlier, the emerging field of biosociology could be staffed in part by Ph.D.s trained in sociology or biology. Finally, he suggests that Ph.D.s might be put to work, much more than they are now, in solving some of America's pressing social problems in areas like transportation, urban decay, energy and crime control. These suggestions seem sensible enough, though one could argue that current Ph.D.s are hardly likely to react with great enthusiasm to the prospect of making their career at a community college or high school. Whatever educational credentials

these jobs may come to require, at the present they by no means require a doctorate, and people wishing to have a career teaching in these institutions can do so without spending the time or money to earn a Ph.D. As for his other suggestions -- that some Ph.D.s can change over to new disciplines as they evolve and that others can work on solving pressing societal problems, like a latter-day high-powered Works Progress Administration, it is unlikely that these outlets, taken together, could accommodate more than a fraction of America's projected Ph.D. production.

Conclusion

After reviewing the forecasts of the academic job market from now until the year 2000, this writer emphatically agrees with Allan Cartter's 1964 prediction (9) that "1970 will be a good year by which to have attained tenure."

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